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EXAMINER	
CHUO, TONY SHENG HSIANG	
ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/790,627	MATHIOWETZ ET AL.	
	Examiner	Art Unit	
	Tony Chuo	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 January 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11 and 24-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11 and 24-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/2/09 has been entered.

Response to Amendment

2. Claims 1-11 and 24-35 are currently pending. Claims 12-23 are cancelled. The previous 112, 2nd paragraph rejections of claims 1-11 and 24-35 are withdrawn. The amended claims do overcome the previously stated 103 rejections. However, upon further consideration, claims 1-11 and 24-35 are rejected under the following new 103 rejections.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-3 and 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Izaki et al (US 2002/0113685), and further in view of Maggert et al (US 6724170).

The Stafford reference discloses a battery pack comprising: a plurality of battery cells “22” wherein the battery cells are elongate and aligned parallel and side by side; a plurality of electrical contacts “34” (electrical interconnects) arranged to electrically connect adjacent battery cells; wherein each cell is covered by housing support “26” comprising a first heat-conductor layer “42” (thermally conductive material) that is shaped to conform to a cylindrical portion of an outer surface of the battery that terminates at first layer ends that are on the cylindrical portion of the outer surface of the battery cell, wherein the first layer has a thickness of 0.04 inches and a thermal conductivity of 193 Watts/meter-°K; and a second structural support outer layer “48” (thermally insulating material) that is shaped to conform to an outer surface of the first heat-conductor layer that contacts all of the outer surface of the first heat-conductor layer, and that extends beyond the outer surface to enclose the first layer ends, the second layer defines an exterior surface of the enclosure of the battery cells which separates the battery pack from the environment, wherein the second layer has a thickness of 0.020 inches and a second value of thermal conductivity (See column 3 line 67 to column 4 line 2, column 4, lines 9-10, and column 4 line 56 to column 5 line 24, and Figures 1, 3, 4, & 5). It also discloses (See column 4, lines 9-10). It also discloses a first heat-conductor layer that comprises two thermally conductive half-shells “26a” &

“26b” that each cover one side of a round surface of the battery (See column 4, lines 18-19).

Examiner’s note: It is the position of the examiner that a temperature of the outer surface of the second layer that is less than 130°C during an electrical short circuit condition of the cells is an inherent property of a battery cell that has a first layer of thermally conductive material that is shaped to conform to a cylindrical portion of an outer surface of the battery cell and a second layer of thermally insulating material that is shaped to form an enclosure of an outer surface of the first layer. In addition, the Stafford battery pack is also an intrinsically safe equipment because of the inherent properties of the battery housing support.

However, Stafford et al does not expressly teach a protective device including a fusible link coupled to a connected lead and the electrical energy storage cells which is encased in potting compound; electrical interconnections that interconnect the plurality of battery cells in a series circuit with the protective device and the electrical contacts; and a plastic resin shell shaped to receive the plurality of covered cells and the protective device. The Izaki reference discloses a battery pack comprising: a plurality of batteries and a protective device including a fusible metal “16” (fusible link) coupled to a terminal "4" (connected lead) and the batteries, wherein the fusible metal is encased in a cover film “18” (potting compound); electrical interconnections that interconnect the plurality of batteries in a series circuit with the protective device and the electrical connection leads; and a battery pack body “29” shaped to receive the plurality of covered cells and the protective device (See Figure 9 and 13 and paragraphs

[0206],[0211],[0213],[0214]). Examiner's note: It is well known in the art that battery pack housings are made of plastic resin materials.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford battery pack to include a protective device including a fusible link coupled to a connected lead and the electrical energy storage cells which is encased in potting compound; electrical interconnections that interconnect the plurality of battery cells in a series circuit with the protective device and the electrical contacts; and a plastic resin shell shaped to receive the plurality of covered cells and the protective device in order to prevent overheating of the battery during short circuiting by utilizing a fusible metal to break the circuit, thereby assuring safety of the battery and to utilize an battery case that is easily and economically constructed.

However, Stafford et al as modified by Izaki et al does not expressly teach a plurality of elongated separation bars positioned between adjacent electrical energy storage cells and between the plurality of electrical interconnects to reduce shorting and provide mechanical support. The Maggert reference discloses a plurality of plastic casings "202", "501", "502" (elongated separation bars) positioned between the adjoining cells and between the plurality of electrical interconnects "110" to prevent shorting (See column 3 line 66 to column 4 line 4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford/Izaki battery pack to include a plurality of elongated separation bars positioned between adjacent electrical energy

storage cells and between the plurality of electrical interconnects to reduce shorting and provide mechanical support in order to improve the safety of the battery by preventing the tabs from shorting to either tabs or other cell housings.

5. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Izaki et al (US 2002/0113685) and Maggert et al (US 6724170) as applied to claim 1 above, and further in view of Dansui et al (US 2003/0013009).

However, Stafford et al as modified by Izaki et al and Maggert et al does not expressly teach a first layer of material that comprises aluminum or copper. The Dansui reference discloses a battery housing that is made of aluminum or copper (See paragraph [0013]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford/Izaki/Maggert battery housing support to include a first layer of material that comprises aluminum or copper in order to utilize a material that has excellent thermal conduction properties and is suited for suppressing a battery temperature rise.

6. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Izaki et al (US 2002/0113685) and Maggert et al (US 6724170) as applied to claim 1 above, and further in view of Toyoda (JP 2001-243927).

However, Stafford et al as modified by Izaki et al and Maggert et al does not expressly teach a second layer of material that comprises heat-shrink tubing or elastic

material. The Toyoda reference discloses a heat shrink member "8" that is also an elastic material that covers a battery (See paragraph [0008]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford/Izaki/Maggert battery housing support to include a second layer of material that comprises heat-shrink tubing or elastic material in order to improve the reliability of the outer package of the battery while preventing the generation of an outside short circuit.

7. Claims 24-27 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Izaki et al (US 2002/0113685) and Maggert et al (US 6724170) as applied to claim 1 above, and further in view of Pajakowski et al (US 6718425).

However, Stafford et al as modified by Izaki et al and Maggert et al does not expressly teach an apparatus comprising a data acquisition unit, wherein the apparatus is portable and handheld. The Pajakowski reference discloses a data system (data acquisition unit) for collecting, displaying, and analyzing data that is portable and handheld and is powered by a battery power supply (See Abstract).

Therefore, one skill in the art could have combined the Stafford/Izaki/Maggert battery pack and the Pajakowski data system by known methods with no change to their respective functions, and the combination would have yielded nothing more than predictable results to one of ordinary skill in the art at the time of the invention.

Examiner's note: It is inherent that the apparatus is intrinsically safe because the

combination of a data acquisition unit and a battery cell that has inherent safety features would necessarily result in an apparatus that is intrinsically safe.

8. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Izaki et al (US 2002/0113685), Maggert et al (US 6724170), and Pajakowski et al (US 6718425) as applied to claim 24 above, and further in view of Iwasaki et al (US 6325611).

However, Stafford et al as modified by Izaki et al, Maggert et al, and Pajakowski et al does not expressly teach a short circuit that is external to the battery. The Iwasaki reference discloses an external short circuiting test that forms a hot spot on the cell near the lead member by heat generation due to the resistance of the lead member (See column 7, lines 13-22).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford/Izaki/Maggert/Pajakowski apparatus to include a short circuit that is external to the battery in order to confirm that the battery can maintain high safety even under the application of an extraordinarily high charge voltage.

9. Claims 30-33 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Izaki et al (US 2002/0113685) and Maggert et al (US 6724170) as applied to claim 1 above, and further in view of Kosh (US 2003/0046974).

However, Stafford et al as modified by Izaki et al and Maggert et al does not expressly teach an apparatus comprising a calibrator, wherein the apparatus is portable

and handheld. The Kosh reference discloses a handheld calibration module "12" and a battery located in the handheld module (See paragraphs [0016],[0018]).

Therefore, one skill in the art could have combined the Stafford/Izaki/Maggert battery pack and the Kosh calibrator by known methods with no change to their respective functions, and the combination would have yielded nothing more than predictable results to one of ordinary skill in the art at the time of the invention.

Examiner's note: It is inherent that the apparatus is intrinsically safe because the combination of a calibrator and a battery cell that has inherent safety features would necessarily result in an apparatus that is intrinsically safe.

10. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Izaki et al (US 2002/0113685), Maggert et al (US 6724170), and Kosh (US 2003/0046974) as applied to claim 30 above, and further in view of Iwasaki et al (US 6325611).

However, Stafford et al as modified by Izaki et al, Maggert et al, and Kosh does not expressly teach a short circuit that is external to the battery. The Iwasaki reference discloses an external short circuiting test that forms a hot spot on the cell near the lead member by heat generation due to the resistance of the lead member (See column 7, lines 13-22).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford/Izaki/Maggert/Kosh apparatus to include a short circuit that is external to the battery in order to confirm that the battery

can maintain high safety even under the application of an extraordinarily high charge voltage.

11. Claims 1-4 and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dansui et al (US 2003/0013009) in view of Akashi et al (US 7183021), Izaki et al (US 2002/0113685), and further in view of Maggert et al (US 6724170).

The Dansui reference discloses a temperature regulated, enclosed battery pack comprising: a plurality of enclosed batteries “1” that are elongate and aligned parallel to one another and side by side; a plurality of electrical interconnects "14" arranged to electrically connect adjacent batteries in series; and a resin-made housing “2” shaped to receive the plurality of enclosed batteries (See paragraph [0020]).

However, Dansui et al does not expressly teach a first layer of thermally conductive material that is shaped to conform to a cylindrical portion of an outer surface of the electrical energy storage cells, the first layer terminating at first layer ends that are on the cylindrical portion of the outer surface of the electrical energy storage cells, the first layer having a first thickness and a first value of thermal conductivity, and the first layer comprises aluminum; a second layer of thermally insulating material that is shaped to form an enclosure of an outer surface of the first layer, contacts all of the outer surface of the first layer, and that extends beyond the outer surface to enclose the first layer ends, the second layer defining an exterior surface of the enclosure of the electrical energy storage cell, the second layer having a second thickness and a second value of thermal conductivity; wherein the enclosure controls the outer surface temperature of the combined enclosure and electrical energy storage cells such that the

temperature regulated, enclosed electrical energy storage cell pack comprises intrinsically safe equipment; wherein an exterior temperature of the outer surface of the second layer is less than 130°C during the electrical short circuit of the electrical energy storage cell.

The Akashi reference teaches the concept of a casing film “26” comprising: an aluminum sheet "26b" (thermally conductive material) that is shaped to conform to an outer surface of an electrical energy storage cell "25” wherein the aluminum layer has a thickness of 40 μm and a first value of thermal conductivity; and a nylon sheet “26a” (thermally insulating material) that is shaped to form an enclosure of an outer surface of the aluminum sheet, wherein the nylon sheet contacts all of the outer surface of the aluminum sheet, wherein the nylon sheet defines an exterior surface of the enclosure of the electrical energy storage cell, wherein the nylon sheet has a thickness of 25 μm and a second value of thermal conductivity, wherein casing film controls the outer surface temperature of the combined casing film and electrical energy storage cells such that the temperature regulated enclosed electrical energy storage cell pack comprises intrinsically safe equipment; wherein an exterior temperature of the outer surface of the nylon sheet has a measured maximum temperature of 120°C or less during an externally short circuited condition (See column 18, lines 35-50, column 21, lines 1-4, column 23, lines 25-66).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Dansui batteries to include a first layer of thermally conductive material that is shaped to conform to a cylindrical portion of an

outer surface of the electrical energy storage cells, the first layer terminating at first layer ends that are on the cylindrical portion of the outer surface of the electrical energy storage cells, the first layer having a first thickness and a first value of thermal conductivity, and the first layer comprises aluminum; a second layer of thermally insulating material that is shaped to form an enclosure of an outer surface of the first layer, contacts all of the outer surface of the first layer, and that extends beyond the outer surface to enclose the first layer ends, the second layer defining an exterior surface of the enclosure of the electrical energy storage cell, the second layer having a second thickness and a second value of thermal conductivity; wherein the enclosure controls the outer surface temperature of the combined enclosure and electrical energy storage cells such that the temperature regulated, enclosed electrical energy storage cell pack comprises intrinsically safe equipment; wherein an exterior temperature of the outer surface of the second layer is less than 130°C during the electrical short circuit of the electrical energy storage cell in order to improve the safety of the battery by utilizing a casing film that controls the outer surface temperature during an externally short-circuited condition.

Examiner's note: It is inherent that the electrical energy storage cell produces heat at a hot spot during the short circuit and the first layer of material spreads flow of the heat over a portion of the outer surface of the first layer that is larger than the hot spot and the second layer of material retards flow of the heat to an outer surface of the second layer.

However, Dansui et al as modified by Akashi et al does not expressly teach a protective device including a fusible link coupled to a connected lead and the electrical energy storage cells which is encased in potting compound. The Izaki reference discloses a battery pack comprising: a plurality of batteries and a protective device including a fusible metal “16” (fusible link) coupled to a terminal "4" (connected lead) and the batteries, wherein the fusible metal is encased in a cover film “18” (potting compound) (See Figure 9 and 13 and paragraphs [0206],[0211],[0213],[0214]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Dansui/Akashi battery pack to include a protective device including a fusible link coupled to a connected lead and the electrical energy storage cells which is encased in potting compound in order to prevent overheating of the battery during short circuiting by utilizing a fusible metal to break the circuit, thereby further improving the safety of the battery.

However, Dansui et al as modified by Akashi et al and Izaki et al does not expressly teach a plurality of elongated separation bars positioned between adjacent electrical energy storage cells and between the plurality of electrical interconnects to reduce shorting and provide mechanical support. The Maggert reference discloses a plurality of plastic casings “202”, “501”, “502” (elongated separation bars) positioned between the adjoining cells and between the plurality of electrical interconnects “110” to prevent shorting (See column 3 line 66 to column 4 line 4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Dansui/Akashi/Izaki battery pack to include a

plurality of elongated separation bars positioned between adjacent electrical energy storage cells and between the plurality of electrical interconnects to reduce shorting and provide mechanical support in order to improve the safety of the battery by preventing the tabs from shorting to either tabs or other cell housings.

Response to Arguments

12. Applicant's arguments filed 12/2/09 have been fully considered but they are not persuasive.

The applicant argues that the claims have been amended to clarify that in response to an electrical short circuit, the exterior of the device will not exceed 130°C. This is not shown in any of the cited references.

In response, the examiner contends that the Stafford battery housing support inherently controls the exterior temperature of the housing support such that the outer surface of the housing support has a maximum temperature of 130°C during a short circuit condition because the Stafford reference discloses a first layer of thermally conductive material and a second layer of thermally insulating material that performs the same function as the first and second layers of the present invention. In addition, there is no evidence to show that the Stafford battery housing support does not have an exterior temperature that is less than 130°C during an electrical short circuit condition.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571)272-0717. The examiner can normally be reached on M-F, 9:00AM to 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC

/Jonathan Crepeau/
Primary Examiner, Art Unit 1795